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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,762	06/25/2001	Yonina C. Eldar	0492611-0395(MIT 9170)	9398

7590 01/20/2004
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EXAMINER

BURD, KEVIN MICHAEL

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 01/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/888,762

Applicant(s)

ELDAR ET AL.

Examiner

Kevin M Burd

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4-5. 6) ☐ Other: _____

Information Disclosure Statement

1. The information disclosure statements (IDS) submitted on 12/10/2001 and 8/12/2003 are being considered by the examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 14-27 and 37-48 are rejected under 35 U.S.C. 102(e) as being anticipated by Smee et al (US 6,522,683).

Regarding claims 1, 2 and 14-25, Smee discloses an apparatus comprising a bank or plurality of correlators and a method of using the correlators described in column 8, lines 45-64. The received signal is cross-correlated. Walsh functions are used, which are orthogonal (column 7, lines 35-39). In addition, a least mean square (LMS) algorithm is used (column 14, lines 46-48). These processes take place in elements 214, 218, 222 and 224 in figure 2. The output of these elements is feed to a filter 230 that further shapes the output. This filter is a "correlation shaper".

Regarding claim 26, the output of the correlation shaper is fed to downstream elements that will detect and forward or process the received signal.

Regarding claims 27 and 37-48, Smee discloses an apparatus comprising a bank or plurality of correlators and a method of using the correlators described in column 8, lines 45-64. The received signal is cross-correlated Walsh functions are used, which are orthogonal (column 7, lines 35-39). In addition, a least mean square (LMS) algorithm is used (column 14, lines 46-48). These processes take place in elements 214, 218, 222 and 224 in figure 2. The DEMUX 214 receives the signal and process the signal. The correlation takes place on the output of the DEMUX to "shape" the output from element 224.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smee et al (US 6,522,683) in view of the instant application's disclosed prior art (specifically paragraph 0004).

Regarding claim 3, Smee discloses the apparatus and method described in paragraph 2. Smee does not disclose the correlators are a matched filter receiver. However, the instant application's disclosed prior art discloses, in paragraph 0004,

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CDMA receivers use matched filter receivers that try to mitigate the effect of multiple signature signal interference and background noise. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to use the matched filter receiver of the instant application's prior art in the bank of correlators of Smee.

4. Claims 4-6, 9-11, 27-30, 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smee et al (US 6,522,683) in view of Huang et al (US 6,067,292).

Regarding claims 4-6, 9-11, 28-30, 33 and 34, Smee discloses the apparatus and method described in paragraph 2. Smee does not disclose shaping the correlation by minimizing the mean square error. Huang discloses in column 20, lines 14-17, the output of the processed received signal is processed again to minimize the mean square error of the demodulated CDMA signal. This minimizing of the mean square error takes place in a "correlation shaper". It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the teachings of Huang into the apparatus and method of Smee. By minimizing the mean squared error, performance of the receiver and the interference cancellation system can be improved (column 14, lines 46-54).

5. Claims 7, 8, 12, 13, 31, 32, 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smee et al (US 6,522,683) in view of Heikkila (US 2002/0122470).

Regarding claims 7, 8, 12, 13, 31, 32, 35 and 36, Smee discloses the apparatus and method described in paragraph 2. Smee does not disclose shaping the correlation by performing a transformation on the output so that the covariance matrix has the property that the second row is a permutation of the first row. Heikkila discloses a receiver for demodulating the received signal (figure 8, element 46 and paragraph 0106). The output of element 46 is input to element 30. This element shapes the output of the demodulator by minimizing the Mean Square Error (paragraph 0033) that utilizes the rows of a covariance matrix as stated in the abstract. It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the teachings of Heikkila into the apparatus and method of Smee. Minimizing the mean squared error of the symbols allows the data to be properly recovered in the receiver. The data will be free of errors and the receiving process will be more efficient.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Eldar et al (US 2002/0146066) discloses an apparatus comprising a bank of correlators outputting a signal to a correlation shaper as shown in figures 3 and 4.

Contact Information

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

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or faxed to:

(703) 872-9314, (for formal communications intended for entry or for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Burd, whose telephone number is (703) 308-7034. The Examiner can normally be reached on Monday-Thursday from 9:00 AM - 6:00 PM.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3800.



Kevin M. Burd
PATENT EXAMINER
1/13/04